EVALUATION OF COOPERATIVE ATTITUDES IN INDUSTRIAL-ARTS CLASSES

BY

JOHN ALEXANDER FUZAK

B. S., University of Illinois, 1939
M. S., University of Illinois, 1941
Ed. M., University of Illinois, 1945

AN ABSTRACT OF A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF EDUCATION
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EVALUATION OF COOPERATIVE ATTITUDES IN INDUSTRIAL-ARTS CLASSES

I. PROBLEM

This study is an attempt to develop an evaluative instrument which can be used by the industrial-arts teacher to evaluate the attainment of one of his major objectives—development of an attitude of cooperation.

The purposes which such an instrument is intended to serve are:

1. To provide, for those industrial-arts teachers who are striving to develop an attitude of cooperation among their pupils, a confirmable indicator of the success of their efforts.

2. To provide a means for evaluating the effectiveness of methods of teaching and of various types of class organization in industrial-arts classes, in respect to the development of the attitude of cooperation among the pupils.

3. To provide an additional source of information about pupils, which can be used in guidance activities and in reports to parents.

4. To stimulate industrial-arts teachers to give greater emphasis to the development of the attitude of cooperation among the pupils.

II. METHODS

Consistent with the definition of an attitude as an emotionalized state of readiness to act, pupil behavior was selected as the expression of the attitude of cooperation which was most suitable as an index to the attitude. Limitations which were recognized in the use of behavior as an

index to the attitude of cooperation were:

1. External pressures affecting the individual may cause a distorted reflection of his true attitude.

2. The extreme difficulty of determining, from an observation of behavior, what an individual's motives are for performing a given act.

In consideration of the teacher's difficulties in observing and recording behavior by means of time-sampling techniques or the recording of anecdotes, an attempt was made to develop a behavior scale. The Thurstone technique of scale construction was adopted as offering promise for the development of a scale in which specific behavior items, relating to cooperativeness, could be assigned numerical values.[1]

Items of behavior relating to cooperativeness and which were exhibited by pupils in industrial-arts classes, were collected by a survey of literature dealing with cooperation and by observing a number of industrial-arts classes.

Two groups of twenty-five judges — industrial-arts teachers and non-industrial-arts teachers—arranged sixty selected items of behavior into twelve equal intervals, which seemed to the judges to express equal differences between items.

Each item was represented graphically, and the point at which the median of the group fell was accepted as the scale value of that item. The interquartile range or "Q"-value was used as the indicator of spread, or range of placement. A coefficient of correlation of .98 was found between the indexes derived by each of the groups of judges. Analysis also indicated a high degree of agreement between the two judging groups. The two groups of judges were combined

[1]Thurstone, L. L., and Chave, E. J. *The Measurement of Attitude*, Chicago: University of Chicago Press, 1929.

to form a final group of fifty judges for derivation of scale values and "Q"-values.

A number of the items were eliminated on the basis of too wide a range of placement by the judges. ("Q"-values which were too large.) A few items were eliminated in a trial observation period as being too difficult to observe and record. Several items were eliminated on the basis of duplication of scale values or meaning. The retained items were selected so as to be distributed at roughly equal intervals along a twelve point scale. The result was the retention of thirty-eight items, which were arranged in two approximately equal forms of the scale.

Observational procedure was tested and improved, before a check was made on the reliability of observation. The observations of two independent observers were used, one for each form, to check against the observations of the investigator. The observations were carried on for a period of nine clock hours on each form. The mean of the scale values of all behavior items performed by each of sixty-seven pupils in three industrial-arts classes, was computed for the observations of the investigator and the two independent observers. Correlation coefficients of .98 and .97 were found between indexes derived from the investigator's observations and those of the two independent observers. Analysis revealed that the indexes were only slightly affected by differences in the observations, accounting for the high coefficients.

A test of the relevance of items developed by Thurstone, making use of the criterion of irrelevance, determined through the index of similarity, was applied.[2] The index of similarity was a quantitative expression of the relationship between various items of the scale. The two nine hour periods of observation, by the investigator, were used to

[2]Thurstone, L. L., and Chave, E. J. *The Measurement of Attitude*, Chicago: University of Chicago Press, 1929.

compute the indexes of similarity for all items. The results were expressed diagrammatically for each of the items, and non-discriminatory items eliminated by inspection. After application of the criterion of irrelevance, thirty-two items were retained.

The thirty-two items were rearranged to comprise two approximately equal forms of the scale. The two forms and their scale values were:

FORM A

Scale Value	
0.6	Blames another pupil when he is wholly at fault for some mistake or difficulty.
0.9	Belittles another pupil by calling him names.
1.1	Ridicules the efforts of another.
2.0	Demands help from another pupil. (Commands.)
2.5	Refuses another pupil's request for help. (Refers him to the teacher or to other pupils.)
2.9	Rushes to get a machine or tool ahead of another pupil.
3.6	Interrupts when the teacher is talking to, or helping another pupil.
4.7	Protests another pupil's attempt to take a tool which he has been using, and will need again.
5.7	Hangs around a group as an onlooker.
7.2	Obeys the teacher's directions or orders.
8.4	Allows another pupil to take a tool which he has been using, and will need again, without protest.
9.3	Awaits his turn to get, or use, a tool or machine.
9.8	Praises another pupil's project, or work.
10.3	Is careful of another's property, or work.
10.5	When helping another pupil, takes an interest in the task. (Asks questions, volunteers suggestions, etc.)
11.5	Readjusts a machine or tool, after doing an unusual job, so that it will be ready for the next person to use on an ordinary job.

FORM B

0.5 Uses physical force to gain his end. (Pushes, strikes, etc.)
0.7 Hides materials or tools for his own use.
1.1 Ridicules the completed, or partially completed work or project of another.
1.6 Blames another pupil when he is partially at fault for some mistake or difficulty.
2.3 Attempts to get a tool or machine ahead of his turn.
2.7 Takes a tool, which someone else has been using, without asking for it.
3.5 Acts superior or egotistical, in showing another pupil how to perform some operation. (Shows off, etc.)
4.6 Refuses needed help when it is offered to him.
5.5 Struggles along, through a job where help is needed, rather than ask for help.
6.7 Allows another pupil to have his own way when a conflict situation arises.
8.8 Thanks a helper for his help.
9.4 Attempts to compromise when a conflict situation arises in which he is involved.
10.2 Shares a special tool or machine with another pupil, when using it in such a way that it is used for a few minutes, put aside for a few minutes, and then used again.
10.5 Cheerfully helps another pupil who asks him for help. (Pleasant facial expression, voice, bodily carriage, etc.)
11.2 Recognizes a situation in which another pupil needs help, and volunteers his services.
11.6 Modifies his own procedure in order to allow someone else to use a machine or tool.

The coefficient of reliability for the indexes of sixty-four pupils, grades 9 through 12, in four industrial-arts classes in Champaign, Illinois, High School on Forms A and B was .88. The classes were in the areas of woodwork,

metal work, and aircraft woodwork. The observation to determine the indexes was carried on for a period of eighteen hours on each form. Several other classes were observed, in connection with Form A, but were eliminated from consideration in the computation of the coefficient of reliability. They were eliminated because of infrequent occurrence of behavior, and because of the apparent inconsistency of behavior of younger pupils. The inconsistency was important because of the relatively short periods of observation used to check the reliability of the two forms.

Several brief trials were made by industrial-arts teachers in the use of the final scale. They were unanimous in their opinion as to the feasibility of its use.

III. CONCLUSIONS

Recommendations For Use

The industrial-arts teacher may use one of the forms of the scale, and tally the occurrence of the behavior items in the scale for each of the pupils in his class. After an interval of observation (six weeks, eight weeks, or a semester) he can determine the index for each pupil by adding the scale values of the items of behavior which a pupil performed, and dividing by the number of items performed. For example:

Pupil A has performed these items

Item No.	Scale Value
16	9.3
16	9.3
16	9.3
51	10.3
11	10.5
11	10.5
58	11.5
58	11.5
58	11.5
Items performed 9	93.7

$$\text{Index} = \frac{93.7}{9} = 10.4$$

Recommendations for proper use of the scale were suggested by experience gained in observation, and by the two industrial-arts teachers who made a trial use of the scale. These recommendations follow:

The Form

1. The form for tallying the items of behavior may be varied to suit the individual teacher. However, some arrangement whereby the items can be read easily seems preferable.

2. Although the time element is not involved in computing the index, some arangement for separating the tallies according to time periods (class periods, weeks, etc.) is desirable for interpretative purposes.

Ways of Observing

1. Some industrial-arts teachers are in the habit of carrying a clip board as they move about the class. If a teacher attaches one of the recording forms to his clip board, he can record the items of behavior as he observes them. He may also watch the entire class for occurrence of behavior items for brief periods. This seems to be the best procedure.

2. The teacher may spend a few minutes each day in observing the entire class for occurrence of the items. If this is done, certain parts of the class period seem more productive of occurrence of the behavior items involved. The start of the class period, and the end of the class period seem to be the best times. This procedure seems to function satisfactorily if carried on for a long enough time period. (A full semester.)

3. After the teacher becomes familiar with the items in both forms, it is probably best to alternate Forms A and B on alternate days. This will provide a check on the index derived for any pupil.

Use of Results

1. The indexes computed from each of the forms can be compared, for an indication of the reliability of the teacher's observations.

2. The range of items which a pupil performs, as well as his index, may be significant in interpreting his behavior and attitude.

3. Pupils' progress in cooperativeness can be traced through separate time periods in the observation.

4. The information gained through use of the scale can be included in reports to parents, and in the school's pupil records. It may be very significant in counseling individual pupils.

5. The information may be given directly to the pupils to aid them in self-appraisal and improvement.

6. Pupil's progress in the development of cooperativeness in industrial-arts classes, determined through the record, may be used to serve as a check on methods of teaching cooperativeness.

7. The results may also be used as a check on the effectiveness of various types of organization in industrial-arts classes in respect to the development of cooperative attitudes.

Limitations

1. The interpretation must be restricted to cooperativeness in industrial-arts classes. On the basis of this study, prediction of the individual's behavior in outside situations cannot be made safely.

2. The scale does not seem to be applicable to areas of instruction within industrial arts, which are highly individualized. (Machine Shop.)

VITA

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